ATTACHMENT 4 – DOCUMENT COMMENT AND RESPONSES

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STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

444 Hospital Way #300 • Pocatello, Idaho • 83201

C.L. "Butch" Otter, Governor
Toni Hardesty, Director

13 July 2009

Mr. Barry Koch
Special Projects Lead - Mining
P4 Production, LLC
PO Box 816
Soda Springs, ID 83276-0816

Re: *Supplemental Mine Waste Rock Dump and Facility Soil and Vegetation Characterization, Sampling and Analysis Plan, Revision 3,* June 2009

Dear Mr. Koch,

The Agencies and Tribes (A/T) have reviewed and hereby give final approval to *Supplemental Mine Waste Rock Dump and Facility Soil and Vegetation Characterization, Sampling and Analysis Plan, Revision 3,* June 2009, submitted by P4/Monsanto pursuant to Consent Order/Administrative Order on Consent, EPA Docket No. CERCLA-10-2003-0117 (CO/AOC). Rather than send an entire revised version of the SAP, please provide pertinent pages (e.g., spine and cover sheets, title page) to indicate the document is final for insertion into Revision 3. We will also need a new pdf file of the final document.

Please let me know if you have any questions. I can be reached at 208-236-6160 or electronically at michael.rowe@deq.idaho.gov.

Sincerely,

Mike Rowe

Mike Rowe
Regional Mining Project Manager

cc: Robert Geddes (P4/Monsanto)
Cary Foulk (MWH)
Doug Tanner, Bruce Olenick (IDEQ)
Jeff Jones, Mary Kauffman (C-TNF)
Jason Sturm (BLM)
Allen Ruberry (IDL)
Kelly Wright (Shoshone-Bannock Tribes)
Sandi Arena (USFWS)
Dave Tomten (EPA)
Bill Wiley (BIA)
File copy/Monsanto/Correspondence

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June 8, 2009

P4 Production Response to Agencies and Tribes Comments on
Supplemental Mine Waste Rock Dump and Facility
Soil and Vegetation Characterization, Sampling and Analysis Plan
***Revision 2,* April 2009**

General Comments

2-A. Please delete the adjective "inactive" for the word "mines" when referring to the areas under CERCLA characterization (e.g., SOP–NW-9.0a). In order to be consistent with the 2003 Administrative Order on Consent/Consent Order (AOC/CO), it is more appropriate to refer to the project area(s) as the Site(s).

Response: *The word inactive has been removed from document where it is referring to the "Site Investigation" or otherwise in the title of the work being completed under the AOC/CO. (It is retained in the document when distinguishing between specific features that are being actively used from those that are not.)*

2-B. The SAP must incorporate the direction given in an 11 May 09 e-mail from Mike Rowe to Barry Koch and Cary Foulk regarding spring and fall sampling events for characterization of soil and vegetation at Ballard, Henry, and Enoch Valley mines. That direction is as follows.

Spring Sampling

a. P4/Monsanto will sample soil and vegetation at 210 sites plus additional sites related to the Enoch Valley tipple area and the active haul road (south), open pits, and Ballard Mine shop.
b. At 10 sites per mine, vegetation will be separated as to life form (grasses, forbs, woody species). Mines should be stratified as follows with sites to be randomly chosen from already identified quadrats.
    i. Ballard Mine (6 waste rock dumps, 2 partially filled pits, 2 historic ore haul roads) – 1 sample should be randomly selected from each of the 10 potential source areas.
    ii. Henry Mine (5 waste rock dumps, 1 historic haul road) – 1 sample should be randomly selected from each of the 6 potential source areas and the final 4 sites selected randomly from a pool of remaining sites in all 6 areas.
    iii. Enoch Valley Mine (3 waste rock dumps with MWD091 split into two areas) – 3 samples should be randomly selected from each of the 3 potential source areas and the 10th site selected randomly from a pool of remaining sites in all 3 areas.
c. At 10 background sites, vegetation will be separated as to life form (grasses, forbs, woody species). Background sites from the 3 mines can be pooled such that 3 samples should be randomly selected from sites identified in each of the 3 background areas and the 10th selected randomly from a pool of remaining sites in all 3 areas.

d. Sites for which vegetation will be separated by life form (grasses, forbs, woody species) will be part of the total number of sample sites already determined (i.e., these would not be additional sites). Record keeping must be such to allow for a calculated total selenium concentration for each of these sites as if they had been composite samples.

Fall Sampling

a. Forbs should be collected at 10 sites per mine. Mines should be stratified as in the spring with sites to be randomly chosen from already identified quadrats used in the spring sampling event. The protocol proposed by P4/Monsanto is fine for resampling the quadrat in the fall (Section 4.3 of the Field Sampling Plan).
b. Forbs will be collected at 10 background sites. Background sites from the three mines can be pooled such that 3 samples should be randomly selected from each of the 3 background sites and the 10th selected randomly from all 3 sites.

Response: *P4 concurs with the A/T recommendation for evaluating the seasonal variability COPCs in vegetation and suggested sampling scheme. Please note however, there is only one historic haul road at the Ballard Mine, so there are only nine (9) potential source areas.*

Specific text has been added to the SAP text in: Section 2.2.3, Discussion of Sampling Approach Rationale; SAP Tables 1 and 2, Step 7; FSP Section 3.4, Determination of Representative Vegetative Media; FSP Section 4.2, Sample Collection Activities; FSP Section 4.3, Location, Frequency and Schedule; and associated FSP tables. The locations for the early summer life-form and associated forb-only sampling have been randomly selected and are indicated in Table 4-2.

2-C. Screening levels in Table 5-1 of the Field Sampling Plan must be updated per P4/Monsanto response to the second part of A/T Comment 1-28 to Revision 1 of the *S-VSAP*.

Response: *We apologize for the oversight; Table 5-1 has been updated as directed.*

2-D. The language in the first paragraph in Section 6.3, Project Deliverables, of the Field Sampling Plan is applicable to all sampling and analysis plans. Please include this language or similar language in all yet-to-be-approved and future SAPs.

Response: *Comment acknowledged.*

2-E. All major changes between revisions of the document should be underlined to assist in Agency/Tribal review.

Response: *Comment acknowledged. We will underline substantial changes that change the meaning or intent of the text or add new verbiage. Simple editorial changes are not underlined.*

Response to Comments

2-1. Comment 1-3. Table 1, Step 2. The purpose of Principle Study Question 2 and the associated Alternative Action is unclear. As stated, it appears that P4/Monsanto intends to exclude potential source areas that are below risk-based levels from the risk assessment (RA). Premature elimination of source areas from consideration in the RA is not recommended, since all areas within target ecological receptors home ranges should be considered collectively. Excluding the lower risk source areas from the RA could potentially bias the estimation of risk for the of the remaining source areas when considering wider ranging eco-receptors such as elk. Please revise or clarify Principle Study Question 2 and the associated Alternative Action, as necessary.

P4 Response: *The intent of the language in the DQO was not to indicate that sources areas would be eliminated, but that the data would initially be used to conduct a screening level risk assessment, and that if COPCs exceeded the screening levels, they would be carried forward into the RA. The goal of the study is to collect the data sufficient for conducting that process, not to conduct the screening level risk assessment. In addition, all data will be carried forward into the RA to address cumulative effects. The DQO text will be revised to correct and clarify PSQ 2.*

A/T Follow-up: We agree with P4's response, however, we believe that some additional clarification is necessary. As stated in Step 2 of Revision 2 of the SAP, all contaminants of potential concern (COPC) data must be carried forward into the RA to address cumulative effects. Relevant text in both Steps 2 and 3 are somewhat ambiguous about when a COPC can be screened out in the RA process. COPCs may only be screened out during the RA at the appropriate step of the RA, as specified in an approved RA work plan and in accordance with EPA guidance. Relevant text in both Steps 2 and 5 should be revised to clarify this screening process, accordingly.

Follow-up Response: *Further clarifying text has been added as requested.*

2-2. Comment 1-10 (continued). Page 3-3, Section 3.2. Regarding the Sedimentation Areas such as stock ponds on dumps, P4/Monsanto states that these areas ". . . do not support upland vegetation and have been previously characterized for surface water and sediment quality." Provide sufficient descriptive and reference information to substantiate this claim.

P4 Response: *Information pertaining to previous sampling of sedimentation areas will be included in Section 2.0 Program Background. These May and September 2004 data are currently being re-validated and contain riparian vegetation and soil data in the waste dump sedimentation pond and seep areas. The data will not be used in evaluating nature and extent of contamination until the A/T approves data validation and an evaluation of data usability provided by P4.*

A/T Follow-up: In Attachment 1 (FSP), Table 2-1 does not clearly identify any "*riparian vegetation and soil data in the waste dump sedimentation pond and seep areas"* samples that were collected in May 2004. Please revise the table to identify the May 2004 data, as applicable.

Follow-up Response: *The comment response was in error. There are May data, but these are not relevant to the P4 source areas being investigated. Table 2-1 is correct as is*.

2-3. Page 3-7, Section 3.4, Paragraph 1. This section focuses exclusively on ungulate species. Although these are important to consider, they are not the only species of concern at the P4/Monsanto mines. Revise the SAP to clarify that the RA will evaluate exposure to additional herbivores (e.g., rabbits, northern bobwhites, and sparrows) and omnivores (e.g., raccoons and American robin) that are representative of vegetative consumers at the sites, and that these issues will be described in a future RA work plan.

P4/M Response: Clarifying language will be added to indicate that the risk assessment will evaluate exposure to additional herbivores and omnivores that are representative consumers at the sites.

A/T Follow-up: P4/Monsanto did not provide additional text in Revision 2 of the SAP documenting that vegetative material sampled will be representative of the types that will be consumed by site-specific receptors. The discussion remains focused on ungulates. Revise the text documenting that vegetative material sampled will be representative of the vegetation types that will be consumed by site-specific receptors identified in A/T Comment 1-19.

Follow-up Response: *The text has been generalized so that herbivores and omnivores, including mammals and upland bird species will be considered*.

2-4. Comment 1-22. Page 3-9, Section 3.4.2, Paragraph 3. P4/Monsanto indicates that, "if an animal consumes plant roots, it is assumed that they will be exposed to more contamination from ingesting soil that is clinging to the root rather than from contamination within the root cells." The logic here is flawed as it is based only on the concentration in soil relative to root cells; however, exposure is dependent on both concentration and the mass consumed. This statement should be supported by literature studies or empirical evidence from mining sites (P4/Monsanto or regional). Note that this

issue may be particularly important for culturally significant plant species since humans consume more below ground vegetables than above ground.

P4 Response: *Paragraph 3 has been replaced with: "Under saturated conditions, plant roots can be dislodged from the soil and ingested; however this would be highly unlikely at the mine sites, which typically have unsaturated soils where the upland terrestrial plant species are found. Therefore sampling of roots to assess metal uptake by grazers will not be conducted because of the grazing habit of herbivores and resulting insignificant metal uptake that could occur with grazing animals ingesting roots." If culturally significant plants are identified where roots may be consumed and a deviation from the general protocol that will be added to the FSP is required, a sampling protocol will be developed as described in the response to comment 1-C.*

A/T Follow-up: The 2nd sentence of the revised text is confusing and should be modified as follows: "As a result of site-specific soil conditions and known grazing habits of wildlife users, marginal root consumption is expected at the mine sites. Therefore, sampling of roots to evaluate exposure of wildlife is not necessary."

Follow-up Response: *The text has been revised as suggested.*

2-5. Comment 1-27. Page 5-4, Section 5.6. Include a table similar to Table 5-1 listing the RL, MDL and relevant risk-based screening levels for vegetation.

P4 Response: *P4 Monsanto is not aware of published risk-based screening criteria for plant tissue. The screening criteria applicable to vegetation material are the EPA Ecological Soil Screening Level (Eco-SSLs) listed for plants. Per the* Guidance for Developing Ecological Soil Screening Levels (Eco-SSLs) *(USEPA, 2003; http://www.epa.gov/ecotox/ecossl/pdf/ecossl_exec_sum.pdf), "Eco-SSLs are concentrations of contaminants in soil that are protective of ecological receptors that commonly come into contact with soil or ingest biota that live in or on soil. These values can be used to identify those contaminants of potential concern in soils requiring further evaluation in a baseline ecological risk assessment."*

However, in response to one concern in the comment, footnote "1" in Table 5-1 (and equivalent Table 1-2 in the QAPP) will be revised to state that the RLs and MDLs presented are for soil samples only. RLs and MDLs for vegetation samples will be those that results from the method validation for site-specific vegetation (see response to Comment 1-36). Additionally, and with agency concurrence, vegetation samples will not be analyzed for hexavalent chromium as indicated in Sections 1.4.2 and Tables 1-1 and 2-1 of the QAPP. Values obtained by ICPMS for total chromium in vegetation will be used to assess the presence of hexavalent chromium in vegetation.

A/T Follow-up: The A/T agree with the response; however, note that we'll need more specifics for vegetation in the RA work plan.

Follow-up Response: *Comment acknowledged*.

2-6. Comment 1-36. Page 2-6, Section 2.4.1. Due to the nonstandard nature of the project sample preparation, a project specific standard operating procedure (SOP) for sample preparation that is independent of laboratory specific SOPs should be developed. This project specific SOP should be usable by different labs and provide for reproducible, comparable data across labs and time. Furthermore, there will need to be a significant number of data points to show acceptable recovery prior to actual site sample runs. Identify available standard reference materials (SRMs) for the project media.

P4 Response: *A method validation and sample preparation SOP for vegetation will be written and provided as an Appendix to the QAPP. P4 Monsanto will provide the laboratory's MDLs, RLs, and recovery data in a separate deliverable. A vegetation (grass matrix) SRM is being researched, and information on SRMs will be provided in Revision 2.*

A/T Follow-up: The A/T agree with the response. However, the A/T will reassess the SOP based on resulting data (MDLs, RLs, recovery data, etc.) from the method validation study, which as mentioned will be provided in a separate deliverable.

Response: *Comment acknowledged*.

Specific Comments

Sampling and Analysis Plan

2-7. Table 1, Step 5, paragraph 2. It states, "For smaller areas, ten discrete samples will be collected . . ." This appears to differ from language in Step 7 and Section 3.2.1 in the Field Sampling Plan. Please reconcile as needed.

Response: *The text has been revised to be consistent and indicate that five judgmental samples will be collected in the smaller areas*.

2-8. Table 2, Step 4, Temporal boundary. Please revise to make the language in line with Table 1, Step 4, Temporal boundary.

Response: *The text has been revised to be consistent*.

Attachment 1 – Field Sampling Plan

2-9. Section 5.4, pages 5-3 and 5-4.

- bullet **XX**. How will mine pits be designated? Is there a need to do so? Is there a need to differentiate between backfilled, partially backfilled, and open pits? Please revise accordingly.

Response: *Two additional identifiers have been added – PB-Pit Backfill and PO-Pit Other. We know that we will have some samples from partially backfill pits at the Ballard Mine, for which the PB designation will be used. It is uncertain if any other areas in mine pits will be identified for sampling, but if they are, they will get a PO designation and the type of area sampled will be documented. Completely backfilled mine pits are considered as part of the waste dumps as discussed in the plan.*

- bullet **xxx**. Do haul roads need to be defined (e.g., HR001 – Ballard Haul Road, HR002 – Henry Haul Road)? Please revise accordingly.

Response: *New designations have been added as suggested*.

- bullet **YYY**. Based on the example, YYY begins with a letter, which appears to be S for source(?) and then probably B for background. If so, please indicate that. It does, however, lead to the question of why an S or B is needed as that would presumably be covered with XX.

Response: *The S component is unnecessary component of the location identification and has been deleted*.

- bullet **ZZ**. Some sampling will require the differentiation of grasses from forbs. Please add individual media type designations for forbs and grasses.

Response: *A designation for grasses and forbs has been added as suggested*.

- bullets **AA** and **BB**. Move these two bullets to the beginning as these are the first two codes for each unique sample identification number.

Response: *The suggested change has been made.*

(Note these comments hold true for Section 2.3.1 of the Quality Assurance Project Plan.)

Response*: These changes have also be made to the QAPP*.

2-10. Section 5.4, page 5-4, paragraph 2. The sample identification number for equipment rinsate samples will be identified as ER–ZZ–bb. Is it safe to assume that this sample identification number will be preceded by AABB? If so, please indicate accordingly.

An equipment rinsate blank sample will be collected each day of sample collection for each matrix per field team. It is important that equipment rinsate blanks are associated

with each team for each day. It does not appear that this will be possible with this unique identification number. Is this true? If so, then it makes the recording of this information in the field logbooks even more important as this appears to be the only place where this information will exist. (Note this comment holds true for Section 2.3.1 of the Quality Assurance Project Plan.)

Response: *The AABB component has been added. In the field each team will be assigned a range of numbers for their blanks. For example, Team 1 will generate blanks 0 – 20.*

Appendix B, SOP-NW-9.0a

2-11. Section 2.1, page 2, paragraph 1. There is no reference for ASTM Standard D 2488-90. Please provide a reference and ASTM Standard D 2488-90.

Response: *Standard 2488-90 is and old version of 2488-00. The text has been revised to reference the current 2488-00 standard*.

2-12. Section 4.1, page 6, paragraph 1. Please provide ASTM Standard D 2488-00.

Response: *A copy of this standard is attached to this comment response*.

Attachment 2 – Quality Assurance Project Plan

2-13. Section 2.3.1, page 2-2. See comment 2-9.

Response: *These revisions have been made*.

Editorial Comments

General: Change Principle to Principal when referring to Study Questions and at other relevant times.

Sampling and Analysis Plan
Section 1.0, page 1-1, paragraph 1, line 6. Change *P4* to "P4 Production L.L.C. (P4)."
Section 1.0, page 1-1, paragraph 3, line 3. Change *P4 Production L.L.C. (P4)* to P4.
Section 1.0, page 1-2, paragraph 1, line 5. Change *principle* to "principal."
Section 2.1, page 2-2, paragraph 1, Line 11. Change *the* to "on."
Section 2.2.1, page 2-2, Soil, bullet 4. The word *grazing* should be changed to *feeding* to account for non-ungulate/non-grazing species (e.g., small mammals, birds).
Section 2.2.1, page 2-3, Vegetation, bullet 2, line 1. Change *become* to "becomes."
Section 2.2.1, page 2-3, Vegetation, paragraph 1, line 3. Change *COPC* to "COPCs."

Section 2.2.2, page 2-3, paragraph 2, line 1. Change *Mine* to "Mines."
Section 2.2.3, page 2-3, paragraph 3, line 3. Insert a space between *limits)* and *in*.
Section 2.2.3, page 2-4, paragraph 1, line 2. The period goes before the ending parentheses.
Section 2.2.4, page 2-4, paragraph 4, line 10. Delete the second *included*.
Table 1, Step 3, bullet 1. Change *COPC* to "COPCs."
Table 1, Step 3, bullet 1, sentence 2. There is need for an additional word(s) between *the* and *for* (maybe need?) in the sentence. Revise accordingly.
Table 1, Step 3, bullet 9. Change *COPC* to "COPCs."

Attachment 1 – Field Sampling Plan
Section 3.2.1, Partially Backfilled Pits, page 3-6, paragraph 2, line 6. Change *similarly* to "similar."
Section 3.2.1, Active Mine Facilities, page 3-7, paragraph 5, line 4. Change *area* to "are."
Section 3.2.1, Active Mine Facilities, page 3-8, paragraph 1, line 2. Change *judgemental* to "judgmental."
Section 3.4.2, page 3-12, paragraph 1, last sentence. Consider changing this sentence to read, "However, there may be some browsing of woody vegetation (shrubs), and sampling of shrubs will be conducted for assessing risk to animals feeding on source areas at the mines."
Section 4.1, Activity 3, page 4-2, paragraph 1, line 1. Add a comma after *i.e.*
Section 4.1, Activity 3, page 4-3, bullet 4. Delete the second *list of*.
Section 4.3, page 4-5, bullet 2, line 1. Add a comma after *i.e.*
Section 4.3, page 4-5, bullet 2, line 5. Delete the semi-colon after *randomness.*
Section 5.2, page 5-1, paragraph 7, line 4. Delete *and*.
Section 5.3, page 5-2, line 3. Add a comma after *i.e.*
Section 5.3.2, page 5-2, bullet 2. Add a comma after *e.g.*
Table 5-1, footnote 4. Change *level-(NOAEL-)based* to "level (NOAEL)-based."
Appendix B, SOP-NW-9.0a, Section 4.3, Topsoil stockpile, page 13. Delete *to*.

Attachment 2 – Quality Assurance Project Plan
Section 1.0, page 1-1, paragraph 1, line 3. Change to read ". . . as part of the Consent Order/Administrative Order on Consent (CO/AOC)."
Section 1.2, page 1-2, bullet 2, line 7. Change *Duff* to "Duffy."
Section 1.4.3.1, page 1-4, paragraph 6, line 4. Delete the first *be*.
Section 1.4.4.6, page 1-8, paragraph 3, line 3. Change *spike* to "spiked."
Section 1.4.4.6, page 1-8, paragraph 3, line 4. It appears that *1-6* be "1-7."
Section 1.5, page 1-8, paragraph 5, line 7. Should *QAP* be "QAPP?"
Section 2.7.2, page 2-11, paragraph 1, lines 6 & 7. Should *personnel* be "personal?"
Table 1-2, footnote 4. Change *level-(NOAEL-)based* to "level (NOAEL)-based."
Table 1-3, row 4 (Completeness), column 2, line 9. Insert "at" between *growing* and *a*.

Response: *All editorial changes have been made.*

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Designation: D 2488 – 00

Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)[1]

This standard is issued under the fixed designation D 2488; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

***A Summary of Changes section appears at the end of this standard.**

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April 29, 2009

Response to
Agencies and Tribes Comments on *Supplemental Mine Waste Rock Dump and Facility Soil and Vegetation Characterization Sampling and Analysis Plan Revision 1,* February 2009

The following is P4 Production's (P4's) responses to the comments received from the Agencies and Tribes (A/T) on March 12, 2009 for the *Supplemental Mine Waste Rock Dump and Facility Soil and Vegetation Characterization Sampling and Analysis Plan*. Each A/T comment is listed followed by P4's response and an indication of how the text in the sampling and analysis plan was revised, where needed.

General Comments

> 1-A. The terms "naturally-occurring contaminants," "naturally elevated" concentrations, and "natural elements" are used repeatedly throughout this document when referring to sources. First, outside of a few human-made radionuclides, all elements are natural making "natural element" redundant. While some elements made be more concentrated in various rocks that are found in waste rock dumps, those rocks have been displaced from their natural setting and, as such, the elevated concentrations are therefore not "naturally-occurring." CERCLA Section 104(a)(3)(A) strictly prohibits "naturally occurring" (quotes added) substances in their unaltered form from a location where they are naturally found. For clarification, delete the adjective "natural" or adverb "naturally" when discussing mine waste source terms.

Response: *The deletions will be made as directed.*

> 1-B. EPA guidance for soil sampling for CERCLA sites contains several components necessary for consideration when designing a sampling plan to determine the appropriate number of samples and the appropriate number of aliquots per sample for composite sampling to minimize the various errors associated with composite sampling and to determine that the sampling protocol will result in data that meets acceptable decision criteria as specified in the DQOs (Soil Screening Guidance: User's Guide, US EPA OSWER 9355.4-23. 1996; Preparation of Soil Sampling Protocols: Sampling Techniques and Strategies, US EPA EPA/600/R-92/128, July 1992). EPA guidance also suggests that "Since compositing dilutes high concentration aliquots, the applicable detection limits should be reduced accordingly. If the composite value is to be compared to a selected action level, then the action level must be divided by the number of aliquots that make up the composite in order to determine the appropriate detection limit (e.g., if the action level for a particular substance is 50 ppb, an action level of 10 ppb should be used when analyzing a 5-aliquot composite)," (Superfund Program, Representative Sampling Guidance, Volume 1: Soil, EPA 540/R-95/141, 1995). EPA also suggests that sampling plans are based on potentially exposed receptors, including ecological and if receptors with different home ranges are being assessed in the same area, then the compositing scheme must be designed to accommodate the receptor with the smallest home range (EPA Ecological Risk Assessment, FAQs,

http://www.epa.gov/reg3hwmd/risk/eco/faqs/composite.htm). Please provide justification for the number of composite samples per decision unit or exposure area and the number of aliquots per composite according to the information provided above, and include the specifics of this justification in the appropriate relevant sections of the document including revision of the DQOs. Most critical is the revision of the decision criteria to include specific numerical performance criteria that reflect the requisite end-use of the data and the associated adjusted benchmarks (see EPA Soil Screening Guidance: User's Guide, Attachment B, page B-2, Specify the Limits on Decision Errors for an example of the level of needed specificity).

Response*: The following discussion will be added to the SAP:*

The size of the composite sample areas (a 50 by 50 foot quadrat) incorporates the smallest home range of the potential target receptors (a small mammal species). Therefore it is unnecessary to reduce action levels (or laboratory detection limits) in proportion to the number of samples forming the composite.

The use of five samples in each composite is consistent with the EPA Soil Screening Guidance: Technical Background Document (EPA, 1996), which recommends 4 to 5 samples from quadrats up to 100 by 100 feet. In addition, EPA Guidance for Quality Assurance Project Plans (EPA, 2002) allows for consideration of practical issues associated with sample handling and homogenization. The use of five subsamples allows for obtaining enough sample mass for the laboratory, but not so much as to burden the laboratory with excess material or require splitting in the field. (Additional grid locations may be sampled to meet laboratory requirements).

The use of 10 composite samples to characterize the individual waste rock dump areas is in part professional judgment (as well as being consistent with minimum sample number recommendations in ProUCL 4.0). Factors that have been considered include: knowledge of the geology of the waste, and of the waste rock disposal and reclamation practices. In addition, knowledge of previous sampling results has also played into this judgment. Although, the A/T, at this time, have not supported the use of the pre-2004 data for scoping of the soil and vegetation sampling plan pending further assessment of the data quality, it is not possible to ignore what is known of those data and what the expected result of the current program will be based on the previous data. These expectations are: (1) the variability between composite samples for individual waste rock dumps will be acceptable given the absolute concentrations; (2) decisions associated with risk-based screening levels will generally be unambiguous for key parameters; and (3) the data will be primarily used to rank the relative risk of the individual units and provide important information for ranking the relative priority of remedial actions, if required.

Given what is known about the character of the waste rock dumps, the conceptual models, and constraints due to the large, yet relatively uniform, areas to be sampled, the minimum number of samples per unit needed to conduct a statistically meaningful analysis, as indicated in ProUCL 4.0, appears appropriate as indicated in the current DQOs. However, unexpected results, high variability or conditions encountered during

the survey of the waste rock dumps may indicate the need for additional sampling. This eventuality is not excluded by the current plan.

References:

EPA, 1996. *Soil Screening Guidance: Technical Background Document.* U.S. Environmental Protection Agency, Washington DC, EPA/540/R95/128, OSWER 9355.4-17A, May 1996.

EPA, 2002. *Guidance for Quality Assurance Project Plans, EPA QA/G-5*. U.S. Environmental Protection Agency, Washington DC, EPA/240/R-02/009, December 2002.

1-C. A survey of plants of cultural significance to the Shoshone-Bannock Tribes is a component of the vegetation characterization at the three mines, which is good. As part of the future risk assessment, P4/Monsanto must ultimately account for concentrations in edible parts (e.g., roots, above ground vegetation) of those plants present in the survey in some fashion. Acceptable approaches for estimating such inputs could include site-specific concentrations from sampling edible parts of culturally-significant plants, review of the literature for relevant concentrations, and/or use of appropriately conservative assumptions in the risk assessment.

At this time no specific direction is being provided – we are advising you of the range of acceptable approaches. You may consider the need for limited judgmental sampling of plant tissue of interest to Native American populations if such plants are identified in the survey task.

Response: *The SAP will include a general sampling protocol for culturally significant plants. Immediately following the vegetation cover survey, P4 will submit a list of the culturally significant plants found and will work closely with the A/T to make any necessary modifications to the general sampling protocol to account for any unique characteristics of the plants.*

1-D. Page 3-7, Section 3.4. In Appendix A, Forage Habits Literature Review, woody vegetation has been documented as part of the diet of deer, elk, and moose. Elk, deer, and moose occur throughout the Blackfoot River watershed and may occur within the boundaries of the mine site, even if only transitory in nature. As such, woody vegetation on the mine sites may be a component of their diet and therefore should be sampled along with other vegetation. Because the characterization for vegetation is to determine risk to a wide variety of wildlife receptors, consumable woody vegetation needs to be included in the samples where present (in the randomly selected grids).

Response: *Woody vegetation will be sampled separately when present within a quadrat. A general sampling protocol will be added to the SAP whereby leaves will be sampled and handled similar to the grasses and forbs. If specific protocols are required for a particular species then this will be communicated to the A/T using the protocol set up for the culturally significant vegetation.*

1-E. Please paginate pages with tables.

Response: *Page numbers will be added to the tables.*

Specific Comments

Sampling and Analysis Plan

1-1. Section 1.0. Please add the following language to the Introduction where appropriate.

> These reports are being submitted as deliverables for work under the Consent Order/Administrative Order on Consent for the Performance of Site Investigations and Engineering Evaluations/Cost Analysis (EE/CAs) at P4 Production, L.L.C. Phosphate Mine Sites in Southeastern Idaho (08/20/03), EPA Docket No. CERCLA-10-2003-0117.

Response: *The language will be added.*

1-2. Page 2-2, Soil. Please add dermal as an exposure route.

Response: *Dermal will be added as an exposure route.*

1-3. Table 1, Step 2. The purpose of Principle Study Question 2 and the associated Alternative Action is unclear. As stated, it appears that P4/Monsanto intends to exclude potential source areas that are below risk-based levels from the risk assessment (RA). Premature elimination of source areas from consideration in the RA is not recommended, since all areas within target ecological receptors home ranges should be considered collectively. Excluding the lower risk source areas from the RA could potentially bias the estimation of risk for the of the remaining source areas when considering wider ranging eco-receptors such as elk. Please revise or clarify Principle Study Question 2 and the associated Alternative Action, as necessary.

Response: *The intent of the language in the DQO was not to indicate that sources areas would be eliminated, but that the data would initially be used to conduct a screening level risk assessment, and that if COPCs exceeded the screening levels, they would be carried forward into the RA. The goal of the study is to collect the data sufficient for conducting that process, not to conduct the screening level risk assessment. In addition, all data will be carried forward into the RA to address cumulative effects. The DQO text will be revised to correct and clarify PSQ 2.*

1-4. Table 1, Step 3. Delete the discussion of radium-226 and replace it with a simple statement that radium-226 will be investigated if RESRAD indicates potential risk. Please include the supporting documentation and citations that RESRAD will adequately estimate radium-226. Include the methods/calculations in the SAP that are used to make this determination. Add a statement that if those estimates indicate a potential residential risk, further characterization may be required. Please add ingestion and particulate inhalation SSLs to this section, define the basis for screening

that will be used, and identify the analytical methods to be used. Furthermore, there are no established land restrictions for any portions of the mines that guarantee that a future residential scenario is not possible. Therefore, delete from the DQOs any statements proclaiming that radium-226 does not need to be sampled because there is no historic residential use of regional mine sites.

Response: *The revision to the DQOs will be made as requested. The text of the SAP, Section 2, which is related to the DQOs, will be revised to include summary information from the following discussion -*

The RESRAD V6.4 computer code is used to perform a preliminary investigation to assess if radium-226 levels at the site indicated potential risk based on samples. This assessment can be made based on uranium concentrations in soil. The RESRAD code is used for estimating the carcinogenic risk to human receptors from exposure to radionuclides in soil or soil-like media. RESRAD has been used widely by the U.S. Department of Energy (DOE), its operations and area offices, and its contractors for deriving limits for radionuclides in soil. RESRAD has also been used by the U.S. Environmental Protection Agency (EPA), U.S. Army Corps of Engineers, U.S. Nuclear Regulatory Commission (NRC), industrial firms, universities, and foreign government agencies and institutions. Radium-226 is included as a principal radionuclide included in the RESRAD database. The RESRAD model will generate acceptable estimates of radium-226 and related uranium daughter products over time.

The RESRAD model to be developed for the waste-rock sites will include radium-226 values from uranium data collected during the 2009 field season. In risk assessment, if screening results from the model produce estimates that indicate a potential risk, further characterization may be required including potentially collecting specific radium-226 data. The soil samples will be used to determine if the radium-226 levels exceed EPA soil screening levels (SSL). The SSL's for radium-226 will be determined from the current EPA standard for ingestion and particulate inhalation. Some key reference for the RESRAD program and its use are: ANL (2001), Gilbert, et al. (1983); and Yu, et al. (1993 and 1994).

The following is supplementary information provided in this comment response only -

The RESRAD model code assesses three exposure pathways by which radionuclides can enter the body as shown in Table 1. In the first pathway, exposure is by external radiation from radionuclides outside the body. In the second and third pathways, exposure is by internal radiation from radionuclides that are inhaled or ingested. These three types of exposure correspond to the three kinds of dose conversion factors. For each exposure pathway, radionuclides can migrate from a source to a human exposure location by many environmental pathways. The major categories of environmental pathways are listed in Table 1. The items listed should be regarded as environmental pathway categories rather than individual pathways, because many of the items can correspond to more than one pathway and some of the items can occur as segments in more than one pathway. For example, there are many different plant food pathways, and contaminated groundwater can contribute to the human drinking water pathway and also to several food pathways if contaminated water is used to irrigate crops or water livestock.

TABLE 1 Potential Pathways

- External radiation
  - Ground
    - Volume source[a]
    - Surface source[a,b]
  - Air
    - Dust
    - Radon and radon decay products
    - Other gaseous airborne radionuclides
  - Water
- Inhalation
  - Dust[a]
  - Radon and radon decay products[a]
  - Other gaseous airborne radionuclides[a,c]
- Ingestion
  - Food
    - Plant foods (vegetables, grains, and fruits)[a,d]
    - Meat[a]
    - Milk[a]
    - Aquatic foods (fish, crustacea, and mollusks)[a]
  - Water
    - Groundwater (well)[a]
    - Surface water[a]
  - Soil[a]

a. Pathway used to derive site-specific soil guidelines.
b. The surface source can be approximated by assuming a very thin layer of contamination (e.g., 0.001 m).
c. Special model for tritium since tritiated water includes the contribution from dermal absorption of vapor.
d. Special model for C-14 since CO2 includes incorporation by photosynthesis

Major pathways used to derive site-specific soil guidelines in the RESRAD code are footnoted in Table 1 and illustrated in Figure 1. Minor pathways for on-site exposure are not taken into account in deriving soil guidelines with RESRAD models because the dose contribution from these pathways is expected to be insignificant. External radiation from a surface layer formed by redeposition of airborne radionuclides carried by the wind from an exposed contaminated zone is expected to be insignificant compared with external radiation from the residual radioactive material in its original location (Yu 1993). External radiation from contaminated water is expected to be insignificant compared with internal exposure from radionuclides ingested in drinking water. The external radiation dose from airborne dust is much smaller than the inhalation dose from dust by a factor of 100 or more for radionuclides in the uranium-238 series (Gilbert et al. 1983). The external radiation dose from airborne radon decay products is negligible compared with (1) the internal inhalation dose to the lungs, (2) the external radiation dose from the parent radium in the soil, or (3) the internal radiation dose from ingestion of plant foods grown in the radium-contaminated soil (Gilbert et al. 1983). The transport and dosimetry for gaseous airborne radionuclides other than radon decay products (e.g., C-14 occurring in CO_2 or tritium occurring in tritiated water vapor) require special consideration. Some of the minor pathways not considered in the RESRAD code are

considered in other codes of the RESRAD family of codes (Yu et al. 1994, Cheng et al. 1998).

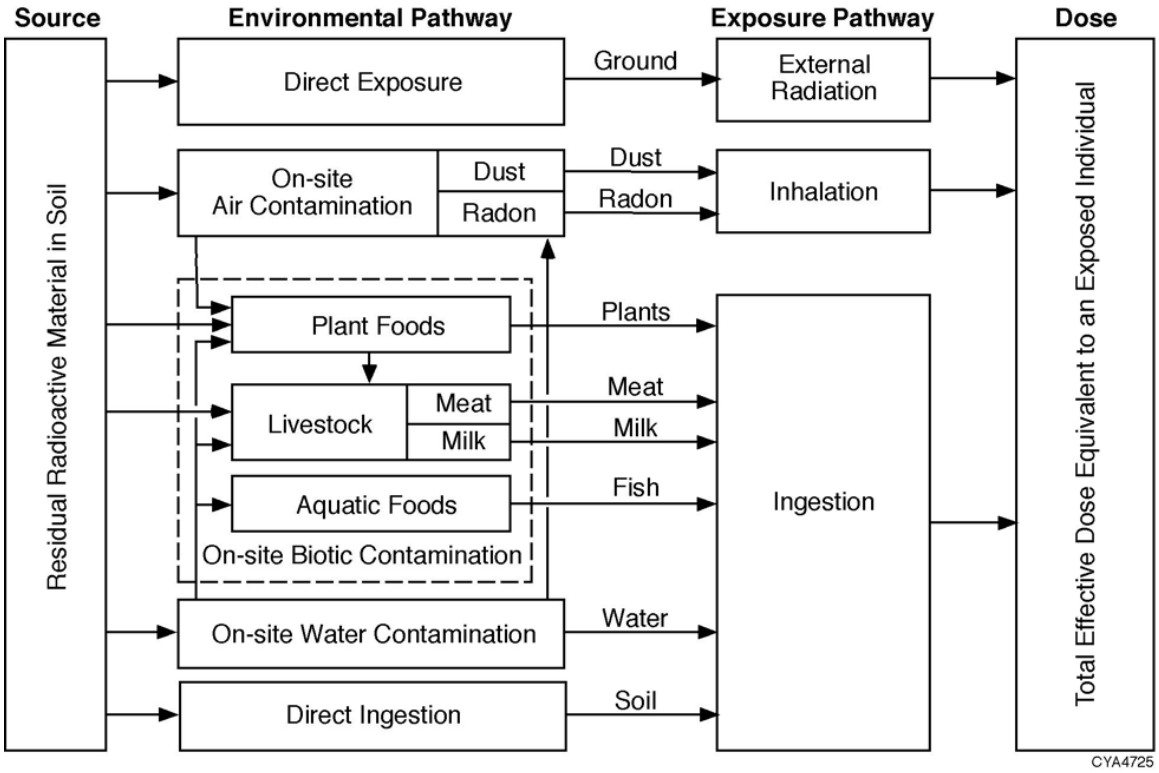

FIGURE 2.2 Schematic Representation of RESRAD Pathways (Modified from Yu, 1993)

References:

ANL 2001. User's Manual for RESRAD Version 6, ANL/EAD-4, Environmental Assessment Division, Argonne, Illinois, July.

Cheng, J.J., 1998, "A Methodology for Estimating Radiation Exposures to Tritium in Buildings," presented at the Health Physics Annual Meeting, Minneapolis, Minn, July.

Gilbert, T.L., et al., 1983, Pathways Analysis and Radiation Dose Estimates for Radioactive Residues at Formerly Utilized MED/AEC Sites, ORO-832 (Rev.), prepared by Argonne National Laboratory, Argonne, Ill., for U.S. Department of Energy, Oak Ridge Operations, Oak Ridge, Tenn., March (reprinted with corrections Jan. 1984).

Yu, C., et al., 1993, Data Collection Handbook to Support Modeling the Impacts of Radioactive Material in Soil, ANL/EAIS-8, Argonne National Laboratory, Argonne, Ill., Apr.

Yu, C., et al., 1994, RESRAD BUILD: A Computer-Model for Analyzing the Radiological Doses Resulting from the Remediation and Occupancy of Buildings

Contaminated with Radioactive Material, ANL/EAD/LD-3, Argonne National Laboratory, Argonne, Ill.

1-5. Table 1, Step 4, Temporal Boundary. Based upon discussion with Michael Amacher, USDA Forest Service Rocky Mountain Research Station, the early summer vegetation sampling should occur between 20 June and 15 July, and the late summer – early fall vegetation sampling should occur between 20 August and 15 September. Please revise the sampling plan and this table accordingly

Response: *The recommended vegetation sampling schedule will be incorporated. However for practical scheduling reasons, we have extended the window for the first sampling event to 15 June through 15 July, for the second event 17 August to 15 September. This way the sampling events begin on a Monday.*

1-6. Table 1, Step 6. Please clarify that the primary statistic of interest is the true mean individual contaminant concentration for soil and vegetation in each source area, but since the determination of the "true mean" would require the collection and analysis of many samples, another sample statistic, the maximum composite concentration, or "Max Test" will be used.

The text states that "The primary statistic of interest will be maximum concentrations for a decision unit. If this concentration exceeds risk-based screening levels, then the 95% UCLs will be evaluated to address uncertainty in the comparison." This is an incomplete decision criterion. Please provide information on what will occur after the uncertainty has been calculated and a comparison made. What are the proposed error or uncertainty criteria?

Please include a statement on whether generic risk-based screening levels will be used and state the relevant source(s) or whether site-specific risk-based screening levels will be used.

Response: *Table 1 Step 6 modified with the text as follows:*

Table 1. Source Area DQOs

Step 6 – Specify Performance or Acceptance Criteria
Ten composite samples will be obtained per source area for statistical analysis. Per ProUCL 4.0, the minimum sample size for background characterization is, ideally, 8 to 10; the minimum sample size for hypothesis testing is, ideally, 10 to 15.

The primary statistic of interest is the true mean individual contaminant concentration for soil and vegetation in each source area. However, the determination of the "true mean" would require the collection and analysis of a prohibitive number of samples (a virtual 100% census of the area by definition). Therefore, the maximum contaminant concentration, or "Max Test" will be used. The maximum contaminant concentration from composite samples is a conservative estimate of the true mean (EPA 1996; Soil Screening Guidance: User's Guide. OSWER 9355.4-23).

If this maximum contaminant concentration value exceeds risk-based screening levels, then the 95% UCLs will be estimated and used to address uncertainty in the comparison. If the 95% UCL value is greater than the maximum contaminant concentration, then the 95% UCL value may be used to characterize the contamination for the source area.

Soil Screening Levels (SSLs) will use generic risk-based levels identified by EPA (See Table 1-2 of the QAPP). Background levels may be used in place of the generic SSLs if background levels are higher than the generic SSLs.

The precision, accuracy, representativeness, comparability, and completeness criteria and the minimum detection limits will be used to evaluate the usability of analytical data in making decisions about the nature and extent of soil and vegetation contamination at potential source areas from mine related activities.

All data will meet approved usability as defined in the QAPP.

Specific details of the sampling design are set forth in this SAP, the FSP, and the QAPP.

1-6 (continued) The qualifications of field personnel seem better suited to include in Step 5.

Response: *The field personnel qualifications have been moved to Section 1.5 (Training Requirements) of the QAPP or Section 6.1 (Project Team) of the FSP.*

1-7. Table 2, Step 1. See previous comments regarding use of the adjective "natural" or "naturally-occurring."

Response: *Refer to response to comment 1-A.*

1-8. Table 2, Step 4, Spatial boundary, Sentence 2. Please revise the sentence as follows, "Selected areas should be typical of the soil profile in place prior to disturbance where mine waste would be placed."

Response: *The sentence will be revised as directed.*

Attachment 1 – Field Sampling Plan

1-9. Page 3-1, Section 3.1. All potential source areas that may contain culturally significant vegetation should be included in the survey. An example of a potential source area that may contain readily accessible culturally significant vegetation is the shoulder of haul roads. Revise to expand the survey to include all potential source areas with culturally significant vegetation.

Response: *The text will be revised to clarify that all potential source areas will be surveyed for culturally significant vegetation.*

1-10. Page 3-3, Section 3.2. The remedy ultimately must address all significant risks associated with all potential source areas at the three mine sites, even if they are active facilities and covered under separate closure plans. For example:

- The area of the active stockpile at the Enoch Valley Mine tipple and shop area will require characterization at some point in the future. We recognize that it may not make sense to characterize these source areas at this time. This issue may be addressed by disclosing relevant information on status and conditions in the RI report and crafting alternatives in the FS that defer characterization and necessary cleanup (if any) of these areas to a later date. If some portions of these source areas are no longer in use, then some preliminary sampling should be conducted now.

- With respect to on-site active haul routes, the SAP must be revised to characterize current conditions. These sampling activities are currently feasible and should be implemented this summer. This information is necessary to evaluate risks, and determine whether remedy alternatives must be developed.

- With respect to the off-site haul road, we believe there is a need to characterize this mine site feature to determine the nature and extent of contamination. The haul road is a part of the Site as we use that term in the CERCLA context. We recognize that this haul road is active and may be used for many years to come, and that that presents logistical concerns. In any case, it would be appropriate to characterize nature and extent of contamination along the haul road. This characterization activity may be deferred and handled as a separate operable unit.

Revise the FSP to include all active mine facilities that are potential source areas at the three P4/Monsanto mine sites, accordingly.

Response: *The FSP will be revised to include:*

- *the berms of the seldom used haul road that comes up from the southeast corner of the mine, and*

- *the margin of the tipple area;*

- *as well as miscellaneous small areas in the mine pits and the Ballard Shop area.*

Five sample grab samples will be collected from each of these areas approximately evenly spaced in the areas of interest. In concurrence with the A/T, work on the remaining active areas in the Enoch Valley and the external active haul road will be deferred to a later date as well as possibly a more detail evaluation of the tipple area.

1-10 (continued) Regarding the Sedimentation Areas such as stock ponds on dumps, P4/Monsanto states that these areas ". . . do not support upland vegetation and have been previously characterized for surface water and sediment quality." Provide sufficient descriptive and reference information to substantiate this claim.

Response: *Information pertaining to previous sampling of sedimentation areas will be included in Section 2.0 Program Background. These May and September 2004 data are currently being re-validated and contain riparian vegetation and soil data in the waste dump sedimentation pond and seep areas. The data will not be used in evaluating nature and extent of contamination until the A/T approves data validation and an evaluation of data usability provided by P4.*

1-11. Page 3-4, Section 3.2.1, Waste Rock Dumps. Although steps were taken to ensure that clumping was not a concern with sampling on the waste rock dumps and realizing that the quadrats were randomly chosen, it still appears that large areas of the dumps will not be sampled. How can the Agencies and Tribes be assured that the entire dump surface is being adequately characterized when quadrats are not distributed relatively evenly over the whole dump?

Response: *See the response to comment 1-B regarding dump composition. Given what is known about the waste rock dumps, P4 feels that 10 randomly selected samples will provide adequate coverage and estimation of COPCs for the waste rock areas regardless of how the samples are dispersed. It should be noted, that with changes due to the A/T comments, at least 160 composite samples will be collected for the waste rock piles from the overall site.*

1-12. Page 3-4, Table 3-1. P4/Monsanto is proposing to collect 10 composited samples (one composite from each of ten quadrats) for the waste dumps listed in Table 3-1. Provide an estimate of the area of each waste dump listed in Table 3-1 so the Agencies and Tribes can assess the range in waste dump areas that will be addressed by the sample plan of 10 composite samples per dump. Also, split MWD091 into two source areas because of its very large area and because there are two obvious portions that are separated by a pit.

Response: *An estimate of area will be provided for each waste rock dump. In addition, waste rock dump MWD091 will be split into two areas (one on either side of the open pit).*

1-13. Page 3-5, Paragraph 1, [Section 3.2.1, Open Pits]. Based on a cursory review of the site maps, it appears that the two referenced partially backfilled open pits at Ballard Mine (MMP035 and MMP036) are too large to incorporate into the adjoining waste dumps and should be sampled as individual potential source areas. Other backfilled pits should be delineated and sampled for soil and vegetation separately from the contiguous waste rock dumps unless P4/Monsanto can demonstrate that the subject backfilled pits are small enough to justify redefining the dump area to incorporate the backfilled pit. P4/Monsanto should provide criteria to make this determination in the FSP.

Response: *The partially backfilled pits at Ballard Mine (MMP035 and MMP036) will be delineated and sampled separately from the adjacent waste rock dumps. No other pit backfills are known in the Ballard mine area that could be considered as individual dumps. Other vegetated areas in the pits are already addressed in the plan and if found may be sampled using a discrete sampling scheme upon consultation with the A/T (see Section 3.2.1 of the FSP). Other backfilled mine pits at the Henry and Enoch Valley Mines are contiguous with their adjacent mine waste dump and because of reclamation the pit backfill is not distinguishable from the external dump. In practicality, there is no discernable difference in the waste rock cover in these areas from either risk or remediation stand points.*

> 1-14. Page 3-5, Section 3.2.1, Historic Ore Haul Roads. There appear to be inactive sections of haul road adjacent to and over MWD091 and MWD092 at the southeast end of Enoch Valley Mine. As these are significant features and represent a population separate from the adjacent dump, it is not appropriate to lump them with the adjacent dump for purposes of characterization. This road should be designated a source area and sampled similar to the two former haul roads at Ballard and Henry mines.

Response: *See response to comment 1-10. The berms of this road will be sampled per A/T instruction.*

> 1-15. Page 3-5, Section 3.2.1, Historic Ore Haul Roads, Paragraph 1. Similar to the previous comment on sampling active mine facilities, the remedy must address all significant risks associated with all potential source areas at the three mine sites, even if they are active facilities and covered under separate closure plans. The active haul roads included. Revise the FSP to include all active mine facilities that are potential source areas at the three P4/Monsanto mine sites, accordingly.

Response: *The text will be revised to indicate that the active haul road at Enoch Valley will be sampled per the response proved to comment 1-10. Ballard and Henry Mines do not contain active haul roads. It is our understanding that the A/T will allow the characterization of the off-site haul road to be deferred.*

> 1-16. Page 3-5, Section 3.2.1, Historic Ore Haul Roads, Paragraph 3. Please review and edit this paragraph as necessary to clarify how P4/Monsanto is proposing to characterize roads. It was not clear whether P4/Monsanto intended to collect 10 composites from each road or a single ten-part composite. The Agencies and Tribes are concerned that one sample per road may not be sufficient. Provide an estimate of the haul road length and area so the Agencies and Tribes can assess the adequacy of sample coverage for the haul roads.

Response: *The text will be clarified. Each inactive road is treated like a waste rock dump with 10 composites (quadrats) with five samples each distributed along the length of the road. An estimate of length and area for each historic haul road will be included.*

1-17. Page 3-6, Section 3.3. One of the criteria for selection of a background site is that the area of the background site should be comparable in areal extent to the mine waste rock dump being sampled. Please clarify why this criterion is necessary.

Response: *If the goal is to determine the background is in an area where waste rock disposal has occurred, and how that compares to a waste rock dump, then it appears appropriate to compare similar sized areas characterized by a similar number of samples. A smaller area would not be representative of the area potentially covered by a waste rock facility, and a larger area will likely include irrelevant geology and soils. A different approach for the background area such as a transect could be used, but then the data would not be statistically comparable to the waste rock dumps.*

1-18. Page 3-6, Section 3.3. Similar to the concerns with 'coverage' of the waste rock dumps, although steps were taken to ensure that clumping was not a concern with sampling at background areas and realizing that the quadrats were randomly chosen, it still appears that large parts of the background areas will not be sampled. How can the Agencies and Tribes be assured that the background area is being adequately characterized when quadrats are not distributed relatively evenly over the entire background area?

Response: *Refer to the response to comment 1-11. The random sampling will provide the best statistical comparison to a similar sized waste rock dump area. In addition, because the character of the underlying geology and other variables that may contribute to concentrations in the soil are difficult to define or predict a systematic design over the area is difficult to develop (i.e., what is the appropriate spacing between samples).*

1-19. Page 3-7, Section 3.4, Paragraph 1. This section focuses exclusively on ungulate species. Although these are important to consider, they are not the only species of concern at the P4/Monsanto mines. Revise the SAP to clarify that the RA will evaluate exposure to additional herbivores (e.g., rabbits, northern bobwhites, and sparrows) and omnivores (e.g., raccoons and American robin) that are representative of vegetative consumers at the sites, and that these issues will be described in a future RA work plan.

Response: *Clarifying language will be added to indicate that the risk assessment will evaluate exposure to additional herbivores and omnivores that are representative consumers at the sites.*

1-20. Page 3-7, Section 3.4, Paragraph 2. P4/Monsanto indicates that dust on vegetation is not an important pathway due to continual renewing and being rinsed by precipitation. This may be true in some seasons; however the overall precipitation in the region is low. It is unclear whether P4/Monsanto intends to rinse the vegetation prior to analysis – please specify. This would not be necessary if vegetation is continually renewed and rinsed at the site, however it should be noted that dust consumption from vegetation (or other food items) is

usually accounted for during the risk assessment when incidental ingestion of soil is considered.

Response: *P4 does not intend to rinse the vegetation prior to analysis. Language will be added to note that dust consumption from vegetation will be accounted for during the risk assessment when incidental ingestion of soil is considered. The samples will be submitted as they would be consumed.*

1-21. Pages 3-7 to 3-9, Section 3.4.1, Ballard Mine, Henry Mine, Enoch Valley Mine, Last Sentence of Each Section. P4/Monsanto indicates that woody vegetation does not require sampling due to the limited woody vegetation currently on reclaimed land. However, the risk assessment and remedy must consider current and potential future exposures at the mines which may include future encroachment of woody plants onto the reclaimed areas. Therefore, the discussion should address whether and how the SAP will meet this apparent project data need.

Response: *Woody vegetation will be sampled separately when present. A general protocol for sampling woody vegetation will be included in the SAP. Similar to cultural significant plants, if special cases are encountered were a deviation from the general protocol is required, the A/T will be notified and an approach will be proposed.*

1-22. Page 3-9, Section 3.4.2, Paragraph 3. P4/Monsanto indicates that, "if an animal consumes plant roots, it is assumed that they will be exposed to more contamination from ingesting soil that is clinging to the root rather than from contamination within the root cells." The logic here is flawed as it is based only on the concentration in soil relative to root cells; however, exposure is dependent on both concentration and the mass consumed. This statement should be supported by literature studies or empirical evidence from mining sites (P4/Monsanto or regional). Note that this issue may be particularly important for culturally significant plant species since humans consume more below ground vegetables than above ground.

Response: *Paragraph 3 has been replaced with: "Under saturated conditions, plant roots can be dislodged from the soil and ingested; however this would be highly unlikely at the mine sites, which typically have unsaturated soils where the upland terrestrial plant species are found. Therefore sampling of roots to assess metal uptake by grazers will not be conducted because of the grazing habit of herbivores and resulting insignificant metal uptake that could occur with grazing animals ingesting roots." If culturally significant plants are identified where roots may be consumed and a deviation from the general protocol that will be added to the FSP is required, a sampling protocol will be developed as described in the response to comment 1-C.*

1-23. Pages 4-1 and 4-2, Section 4.1. Provide a description of the method(s) that will be used to survey the material and vegetative cover to determine the relative percent coverages on the waste dumps and background areas. Given that some waste dumps and background areas are variable in size and aspect and cannot be viewed from any one vantage point, a systematic approach should be employed to

ensure consistency between waste dumps. Furthermore, coverage can change dramatically with aspect and possibly slope. Revise the FSP to more fully describe the methods that will be employed to ". . .spend sufficient time observing each area in order to thoroughly characterize it as to categories present and associated relative abundances." The final method should be able to take into consideration factors such aspect and slope. Note that the Agencies and Tribes do not expect this to be accomplished with using a complicated scheme, such as walking a pre-established grid on each dump or background area; instead the Agencies and Tribes are asking for a survey scheme that assures that all areas of each mine feature are adequately viewed to determine cover abundances.

Response: *The FSP will be revised to include more detail of the method(s) that will be employed to help ensure that all areas of each mine feature are adequately surveyed.*

1-24. Page 4-3, Section 4.2, Activity 5. Please explain the reasoning behind taking 10 discrete samples in the mine pits and Ballard Mine shop area if vegetation is present. It would seem that taking one multi-increment sample, or better yet three multi-increment samples, over what is anticipated as being a relatively small area would do a much better job of characterizing any contamination at the site.

Response: *Because little is known in advance about the character or configuration of the area, five judgmentally-located discrete reconnaissance samples provide a better opportunity for assessing potential COPC presence. Unlike the waste rock dumps a uniformity of a source cannot be assumed. The five discrete samples provide a better opportunity to identify an area of elevated COPC concentrations in relatively small miscellaneous areas like the Ballard Shop Area. The samples can be averaged, if needed. Another consideration may be that the scarcity of vegetation could limit the practicality of multi-incremental or random sampling. The judgmental samples will be selected to cover the range of plant species and soil present in the area, and if needed additional samples may be collected.*

1-25. Page 4-3, Section 4.2, Activity 5, Paragraph 2; Table 4-2. The text and table should be revised to show that soil samples will only be collected once, not in both the spring and fall.

Response: *The text and table will be revised.*

1-26. Page 5-3, Section 5.4. Two letters will denote station type, yet it appears that background samples will be four letters. Three letters/numbers will identify sample quadrat number. The example shows S07 and it is a waste rock dump sample. Is it safe to assume that S stands for source and B for background? If so, indicate such in the text to read ". . . on each source (S) or background (B) area . . ." These same comments hold true in Attachment 2 – Quality Assurance Project Plan, Page 2-3.

Response: *The sample identification scheme will be revised in the FSP and QAPP.*

1-27. Page 5-4, Section 5.6. Include a table similar to Table 5-1 listing the RL, MDL and relevant risk-based screening levels for vegetation.

Response: *P4 Monsanto is not aware of published risk-based screening criteria for plant tissue. The screening criteria applicable to vegetation material are the EPA Ecological Soil Screening Level (Eco-SSLs) listed for plants. Per the* Guidance for Developing Ecological Soil Screening Levels (Eco-SSLs) *(USEPA, 2003; http://www.epa.gov/ecotox/ecossl/pdf/ecossl_exec_sum.pdf), "Eco-SSLs are concentrations of contaminants in soil that are protective of ecological receptors that commonly come into contact with soil or ingest biota that live in or on soil. These values can be used to identify those contaminants of potential concern in soils requiring further evaluation in a baseline ecological risk assessment."*

However, in response to one concern in the comment, footnote "1" in Table 5-1 (and equivalent Table 1-2 in the QAPP) will be revised to state that the RLs and MDLs presented are for soil samples only. RLs and MDLs for vegetation samples will be those that results from the method validation for site-specific vegetation (see response to Comment 1-36). Additionally, and with agency concurrence, vegetation samples will not be analyzed for hexavalent chromium as indicated in Sections 1.4.2 and Tables 1-1 and 2-1 of the QAPP. Values obtained by ICPMS for total chromium in vegetation will be used to assess the presence of hexavalent chromium in vegetation.

1-28. Page 5-5, Table 5-1. Although the industrial human health screening level (SL) for chromium is accurate with the reported EPA SL, there should probably be a footnote that indicates that 1,500,000 mg/kg is not possible, as there are only 1,000,000 mg in a kg.

Response: *A footnote will be added to the table as directed.*

Please make sure that all screening levels in Table 5-1 are up to date at the time of submittal of the final report. For example, EPA Regional Screening Levels were recently updated for some of the COPCs (December 2008):

- Chromium VI human health screening levels should be 39 and 200 mg/kg for the residential and industrial exposure scenarios, respectively.
- Cobalt human health screening levels are available from EPA and should be 23 and 300 mg/kg for the residential and industrial exposure scenarios, respectively.

Response: *The screening levels will be updated to be current for the time of final report submittal.*

1-29. Page 6-3, Section 6.3. Please revise the first paragraph and bullets to read.

"The raw data and data validation reports will be submitted to the A/T when available. Once the validated sampling data are approved by the A/T, a soil and vegetation sampling Data Summary Report (DSR) will be submitted. This report must review the investigative activities that have taken place. The report shall describe (e.g., narrative of results,

> field activity and data summaries, statistical analysis) and display (tables, graphs, figures, drawings, maps, etc.) the location, dimensions, physical condition, and varying concentrations of each contaminant for each source and the known extent of contaminant migration through each of the affected media. Location and characteristics of surface and subsurface features should also be included. The DSR must also evaluate data gaps and identify additional and/or modified sampling and analysis that shall be included in revisions to the SAP for each subsequent field season."

Response: *The text will be revised as directed.*

Attachment 2 – Quality Assurance Project Plan

> 1-30. Page 1-3, Section 1.4.1. The comprehensive QAPP description provided in section 1.1 should be referenced or repeated in Section 1.4.1 since the main objective is to generate data of known and defensible quality, which is a more comprehensive purpose for the QAPP and presents a larger framework than what is described in the first sentence of section 1.4.1.

Response: *The text will be revised as directed.*

> 1-31. Page 1-3, Section 1.4.2, Paragraph 1. Please explain what is meant by reduction of data.

Response: *Data reduction includes all inputs to the calculated concentration. The term used here is consistent with EPA's definition (EPA QA/G-5), "the process of transforming the number of data items by arithmetic or statistical calculations, standard curves, and concentration factors, and collating them into a more useful form. Data reduction is irreversible and generally results in a reduced data set and an associated loss of detail." Generally, laboratory data reduction is performed at the instrument or laboratory information management system (LIMS) level.*

> 1-32. Page 1-4, Section 1.4.3. The data quality indicators or "performance measurement criteria" should be identified on a project specific basis independent of individual method criteria. A table listing project needed specific detection levels, accuracy, precision, and completeness should be provided to precede the analytical method tables. This table could be titled "Project Performance Measurement Criteria;" then a statement could be made to the effect that the selected analytical method specs meet the project measurement performance criteria.

Response: *A table will be added as requested and a statement as suggested will be added to Section 1.4.3.*

> 1-33. Page 1-4, Section 1.4.3.1, Last Sentence. Is this true that different laboratories will be analyzing field duplicates? If not, please revise accordingly.

Response: *The last sentence is incorrect. Field replicates will be analyzed by the same laboratory. The text will be revised accordingly.*

1-34. Page 1-10, Bullet 1, [Section 1.6.4]. Isn't Microbac also going to include 100% of the Level IV deliverables in electronic (pdf) format ALONG WITH 10% of Level IV deliverables in hardcopy? Please revise accordingly.

Response: *The laboratory will deliver data as specified on the first two bullets of page 1-10. LDC, the data validator, will print from the scanned Level 4 reports any page needed for Level 4 validation of the randomly-selected 10% of samples being validated to Level 4 criteria.*

1-35. Page 2-7, Section 2.5.1.1. Deionized water, preferably lab supplied, should be used for equipment blanks NOT distilled water. Please change.

Response: *The text will be revised as directed.*

1-36. Page 2-6, Section 2.4.1. Due to the nonstandard nature of the project sample preparation, a project specific standard operating procedure (SOP) for sample preparation that is independent of laboratory specific SOPs should be developed. This project specific SOP should be usable by different labs and provide for reproducible, comparable data across labs and time. Furthermore, there will need to be a significant number of data points to show acceptable recovery prior to actual site sample runs. Identify available standard reference materials (SRMs) for the project media.

Response: *A method validation and sample preparation SOP for vegetation will be written and provided as an Appendix to the QAPP. P4 Monsanto will provide the laboratory's MDLs, RLs, and recovery data in a separate deliverable. A vegetation (grass matrix) SRM is being researched, and information on SRMs will be provided in Revision 2.*

1-37. Page 2-7, Section 2.5. Please provide controls for sample dilution and elevated detection limits, such as "laboratory will report undiluted as well as diluted sample results and will consult with the project chemist to justify/document need for dilution."

Response: *The text will be revised as directed.*

1-38. Page 2-8, Section 2.5.2.6. Add a statement to the effect that oversight agencies may provide or request performance evaluation samples.

Response: *The text will be revised as directed.*

1-39. Page 2-11, Section 2.7.3. Project QAPP specs should be independent of specific validators, thus the reference to LDC should be deleted.

Response: *The text will be revised as directed.*

1-40. Page 3-1, Sections 3.1 and 3.2. Add a statement to the effect that field and lab audits may be requested or carried out by oversight agencies.

Response: *The text will be revised as directed.*

Editorial Comments

Sampling and Analysis Plan

Page 2-2, Section 2.0, (Partial) Paragraph 1, Line 9. Change *the* to *on*.
Page 2-2, Section 2.0, Soil, Bullet 4, Line 2. The word *grazing* should be changed to *feeding* to account for non-ungulate/non-grazing species (e.g., small mammals, birds).

Attachment 1 – Field Sampling Plan

Page 3-6, Section 3.3, Enoch Valley Mine, Line 6. Change *i.e,* to *i.e.,*.
Page 6-2, Bullet 3. Insert a space between *60* and *days*.

Attachment 2 – Quality Assurance Project Plan

Page 1-1, Section 1.2, Bullet 1. Change *St. Louise* to *St. Louis* .
Page 1-4, Section 1.4.3.1, Paragraph 1, Line 7. Eliminate *and*.
Page 1-5, Section 1.4.3.2, Paragraph 2, Line 1. Do you mean to say that accuracy could be evaluated *with* background level rather than *without*? If so, please revise accordingly.
Page 1-6, Section 1.4.4.1, Paragraph 2, Line 3. Change *calculation* to *calculations*.
Page 1-7, Section 1.4.4.1, (Partial) Paragraph 1, Line 2. Is *in* correct or would *used* be better?
Page 1-7, Section 1.4.4.6, Paragraph 2, Line 4. Change *detected* to *detect*; change *concentration* to *concentrations*; change *that* to *than*.
Page 1-8, Section 1.5, Paragraph 1, Line 3. Does a slash need to be inserted between *reading* and *training* or does one of the words need to be deleted?
Page 1-9, Section 1.6.1, Bullet 5. Change *our* to *or*.
Page 1-10, Section 1.6.4, Bullet 5. Change c*oncentrations* to *concentration*.
Page 2-2, Section 2.2.7, Line 4. Add the word *to* between *order* and *address*.
Page 2-2, Section 2.2.7, Line 4. Add the word *the* before *program*; change *program* to *Program*.
Page 2-6, Section 2.3.7, Bullet 4. Change *refrigerators* to *Refrigerators*.
Page 2-6, Section 2.3.7, Paragraph 2, Line 4. Move *unless* to between *manner* and *otherwise*.
Page 2-6, Section 2.4.2, Bullet 1. Delete *zinc*.
Page 3-1, Section 3-3, Line 2. Change i*ncorporate* to *incorporated*.
Table 2-1, Footnote b. Change *sent* to *send*.

Response: *All editorial revisions will be made.*

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December 9, 2008

VIA ELECTRONIC DELIVERY

Mr. Michael Rowe
444 Hospital Way, #300
Pocatello, ID 83201

Re: Response to Agencies/Tribes Comments on Supplemental Waste Rock Dump Soil and Vegetation Characterization Planning Memorandum, 26 June 2008.

Dear Mr. Rowe:

MWH is submitting, on behalf of P4 Production, the attached response to the Agencies and Tribes (A/T) comments on the 26 June 2008 Supplemental Waste Rock Dump Soil and Vegetation Characterization Planning Memorandum. Each A/T comment requiring a response has been repeated and is followed by P4 Production's response.

We are proceeding with a revision to the above referenced document; however, we will not finalize and submit a draft of the document until notified that these comment responses are considered acceptable to the A/T. In addition, please note that due to the scope of the comments on the Planning Memorandum, the revision will be presented in a different format. The revised document will be presented as a largely self-contained Sampling and Analysis Plan (SAP) including a Field Sampling Plan (FSP) and a Quality Assurance Project Plan (QAPP).

Please feel free to contact me if you have any questions or need any additional information.

Respectfully,
MWH Americas, Inc.

Cary L. Foulk
Supervising Geologist/Geochemist

cc:
Barry Koch, P4 Production
Dean Brame, MWH

Attachment - Response to Agencies and Tribes Comments on Supplemental Waste Rock Dump Soil and Vegetation Characterization Planning Memorandum

2353 130th Ave NE, Suite 200
Bellevue, Washington
98005 USA

Tel: 425 602 4000
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Response to
Agencies and Tribes Comments on *Supplemental Waste Rock Dump Soil and Vegetation Characterization Planning Memorandum.*

Major Concerns

1. The planning memo submitted by P4/Monsanto describes modifications to about eight other existing planning documents. This is confusing and unnecessary. Because this is a new task and involves collection of data not envisioned in the original work plan, it would be appropriate to submit the planning memo as a "stand-alone" document in the form of a Sampling and Analysis Plan (SAP) comprised of a Quality Assurance Project Plan and a Field Sampling Plan. Submittal in the form of an SAP is necessary to comply with the NCP (see 40 CFR 300.415(b)(4)(ii)), and the CO/AOC which states, "All work under this CO/AOC shall be conducted in accordance with CERCLA, the NCP, EPHA, HWMA, Idaho's Water Quality Act, and applicable guidance documents." (see CO/AOC, Section 9.4).

Response: *The work plan will be presented as a SAP and include a QAPP and FSP.*

The document as submitted does not provide for comprehensive planning that clearly identifies objectives and associated procedures for obtaining appropriate data, or document the field procedures that will be followed. It is also inconsistent with the format and content needed for the A/T to be able to approve the document. Thus, the planning document must be revised consistent with this direction and applicable guidance (e.g., Guidance for Quality Assurance Project Plan [EPA QA/G-5, December 2002] and Guidance on Systematic Planning Using the Data Quality Objectives Process [EPA QA/G-4, February 2006]).

Response: *The document will be revised to be consistent with the direction and guidance noted.*

2. The tone of the document is unsatisfactory. Please strike all unnecessary editorial comments and comments outside the scope of a data collection planning document. Several examples are provided below.
   - Page 1, Introduction, Paragraph 1. "Although there are extensive relevant dump soil and vegetation sampling results from work done to date by the Idaho Mining Association (IMA) at randomly selected dumps, other phosphate mining companies at their nearby dumps, and by P4 Production at some dumps at each of their three inactive phosphate mines (these sampling results are included herein as Appendix A)." This comment is editorial and misleading and must be deleted. The "extensive" data that P4/Monsanto indicates have been collected have not necessarily been determined to be relevant to P4/Monsanto, of sufficient data quality for required uses, and does not include all contaminants of potential concern (COPCs).

- Page 2, Introduction, Paragraph 1. "This memorandum invokes those provisions, modifying them and adding them as necessary to address the IDEQ's perceived data gaps (M. Rowe, IDEQ [e-mail to B. Koch, Monsanto] May 2, 2008). This is editorial and misleading. The data gaps were identified through analysis and consideration of DQOs.
- Page 8, Section 3.2.2, Paragraph 3. "Thus, P4 Production hopes the IDEQ will understand this and honor the agency's prior logical position on the matter set forth in the AOC and manifested in their approval of the interim plan for surface water and sediment in 2002 and the comprehensive site investigation plans in 2004." Direction provided by the Agencies and Tribes is intended to ensure consistency with the NCP, and relevant policy and guidance, and reflect our understanding methods and approaches that must be followed to support appropriate, protective, and defensible decisions.
- Page 8, Section 3.2.2, Paragraph 6. "Despite IDEQ's regional risk assessment showing no risk associated with vegetation deemed culturally important to the Shoshone and Bannock tribes, the agency has [asked] for another survey be performed on and downstream of the P4 Production dumps." Again, the direction provided by the Agencies and Tribes is intended to ensure consistency with the NCP, and relevant policy and guidance, and reflect our understanding of methods and approaches that must be followed to support appropriate, protective, and defensible decisions.

Response: *Unnecessary editorial comments and comments outside the scope of a data collection planning document will be removed from the document.*

3. The Data Quality Objectives (DQOs) as presented are not compliant with EPA guidance and should be revised accordingly. Further, the DQOs are completely focused on selenium with a heavy emphasis on selenium consumption through vegetation. Although this is known to be a problem at the southeast Idaho phosphate mining sites, it is not the only concern that needs to be evaluated. DQOs must address other relevant receptors, routes of exposure, and COPCs as indicated by a site-specific Conceptual Site Model (CSM). Other contaminants (e.g., arsenic) may pose a greater risk to some receptors.

Response: *The DQOs will be revised in accordance with EPA guidance and consistent with discussions between P4 Production, MWH, and the Agencies and Tribes.*

General Comments

A. All deliverables to be considered for the use in the site characterization of the Enoch Valley Mine are subject to Agency approval and as such, are to be submitted as "Draft" until approved as "Final" by the Agencies.

Response: *The document will be submitted as "Draft".*

B. The planning document must better describe the deliverables that will be generated under this effort. In addition to a data summary report, there must be graphical depiction of data, and maps summarizing the findings. Please revise accordingly.

Response: *The document will be revised to specify that a waste rock dump characterization report deliverable will be generated from the work. The report will include graphical presentation of results, including charts and maps.*

Specific Comments

1. Page 1, Introduction. The introductory section focuses on comparing the selenium concentration of vegetation on dumps to National Research Council (2005; NRC) maximum tolerance level (MTL) for selenium in livestock feed, which is currently 5 mg/kg on a dry weight basis. The narrative implies that selenium in vegetation on dumps is the only significant risk driver for upland soil and vegetation. The NRC recommendations are important and relevant information that must be considered in risk assessment and risk management; however, it should be emphasized that the NRC recommendations are not promulgated standards. Other factors that must be considered and discussed in the DQOs are:
   - The need to evaluate risks to receptors posed by other COPCs;
   - The need to evaluate risks to receptors that may be exposed to contaminants in other source areas such as current or former ore stockpiles, loading areas, haul routes, pits, and others; and,
   - The need to evaluate cumulative risks arising from multiple routes of exposure for livestock and wildlife users of the site. (Note that the NRC recommendations do not consider incidental ingestion of soil by livestock or wildlife receptors. Additionally, the 5 mg/kg level discussed as a compliance level has not been determined to be the point of departure for needing a remedy. This level could be higher or lower depending on the results of the risk assessment.)

   Based on outcomes from upcoming A/T and P4/Monsanto project meetings, please revise accordingly.

   Response: *The DQOs will be revised based on suggestions and examples provided during a meeting with the A/T 15 October 2008 and from review comments on draft DQOs (submitted to the A/T 7 November 2008) during conference calls with the A/T held 20 November and 1 December 2008. Revisions include the COPC list provided by the A/T, evaluation of risk from source areas other than the waste rock dumps, and evaluating cumulative risk.*

2. Page 1, Introduction. There are several references to human health risk scenarios and eco-indicator species (elk, jackrabbit, and robin) within the referenced document. There are also summaries of other aspects of the conceptual exposure models for these sites. These are important topics deserving more discussion and comment during development of the risk assessment or through development of a risk assessment work plan or scoping document. We anticipate that these and other issues will be discussed further with P4/Monsanto during upcoming A/T and P4/Monsanto project meetings. The background

Response: *A preliminary conceptual model will be described in the document and it will be acknowledged that it will be refined and verified as the project progresses.*

3. Page 1, Introduction. The introduction should include a discussion of the Agencies' and Tribes' rationale for requiring additional characterization of soil and vegetation at the mine sites. IDEQ outlined the rationale in a letter to P4/Monsanto, dated 1 May 2008, explaining that the soil and vegetation characterization information is needed to assess risks posed by the various sites, and for the development, screening, and detailed analysis of cleanup alternatives. Waste rock dumps and mine pits are potential sources of contaminants and, except for some sampling at Enoch Valley Mine, the number and distribution of soil and vegetation sampling has been minimal. In identifying data gaps, the Agencies and Tribes considered several factors.
   - Upland soil and vegetation are among primary risk drivers at these sites.
   - The post-2004 data have not been fully validated (per EPA guidance).
   - There has been no meaningful assessment of the quality of pre-2004 data (per EPA guidance).
   - There has been no organized presentation of some of the pre-2004 data to understand its spatial distribution (as was previously requested).
   - Data Quality Objectives to date have been confusing and incomplete. The Agencies' and Tribes' rationale and their requirements for the supplemental characterization need to be reflected in the introduction and DQOs. The discussion must be presented in an objective manner to accurately reflect the background of the decision to require the supplemental characterization.

Response: *The document will be revised to include the A/T rationale for requiring the additional characterization work.*

4. Page 1, Introduction, Paragraph 1. Delete everything after the first sentence.

Response: *Accepted.*

5. Page 1, Introduction, Paragraph 2. Delete everything after the first sentence. The relevancy of the National Research Council maximum tolerance level for selenium in livestock feed as it pertains to ecological risk from vegetation grown on waste rock dumps has not been established. Any action levels (whether for monitoring, early action removals, or remedial actions) will be established by the Agencies and Tribes based on site-specific monitoring risk assessments and risk management decisions. Additionally, much of the data referred to in this section was collected prior to the 2003 AOC and as such, sampling protocols and data generation methods were not Agency approved.

Response: *Accepted.*

6. Page 1, Introduction, Paragraph 2. P4/Monsanto states: "The average selenium concentration in vegetation at Ballard Mine was in excess of 5 mg/kg dw, but the averages at the Henry Mine dump and the dump at a non-P4 Production mine were less that 3 mg/kg dw." This statement appears to be in conflict with Table 3 of the referenced document. Assuming Table 3 is correct, selenium in vegetation samples collected in 1998 and 2001 from a single dump (MMW086) at the Henry Mine dump averaged 4.2 mg/kg dw and 5.5 mg/kg dw, respectively, not less than 3 mg/kg dw, as stated. These Henry Mine vegetation data represent a total of 8 samples from only one of five waste dumps at the Henry Mine. This limited sampling from one Henry Mine waste dump does not support P4/Monsanto's premise that selenium concentrations in vegetation are not significantly elevated as implied by p4/Monsanto. Please reconcile as necessary.

Response: *Table 3 will be corrected, the averages recalculated, and the results reported correctly. At this time, pre-existing data will not be used to support any premise regarding selenium, or any other COPC, concentrations; however, the data may be retained or referenced in the document with proper qualifying statements as confirmed by the A/T in the 1 December 2008 conference call.*

7. Page 2, Table 1-1. Much of the data referred to in this table was generated prior to the 2003 AOC and as such, sampling protocols and data generation methods were not Agency approved. Please delete references to the pre-2004 data until such time when P4 provides the Agencies with data validation and a data usability evaluation.

Response: *Pre-existing data may be retained or referenced in the document with proper qualifying statements as confirmed by the A/T in the 1 December 2008 conference call. The data will not be used in evaluating nature and extent of contamination until the A/T approve data validation and an evaluation of data usability provided by P4 Production.*

8. Page 2, Paragraph 1. Delete everything after the first sentence as the field work has now been postponed until 2009, and the work has been identified by the Agencies under the "Additional Work" provision of the AOC.

Response: *The schedule will be revised to 2009.*

9. Page 3, Paragraph 1 and bullets. Delete and incorporate the relevant sections into the SAP and/or reference the appropriate prior documents by citation in the SAP.

Response: *The relevant sections of appropriate, prior documents will be incorporated into the SAP.*

10. Page 3, Paragraph 2. Delete.

Response: *Accepted.*

11. Page 3, Paragraph 4. Delete. Note also that no soil classification SOP was found in Appendix A.

Response: *Paragraph 4 will be deleted. An appropriate soil classification SOP will be appended.*

12. Page 4, Section 3.1.1. Please state the problem. Stating that P4/Monsanto already has performed extensive characterization on dump soils does not address the problem or purpose of this investigation. This first step of the DQOs needs to provide a discussion of the background information that leads to the objectives described in Section 3.3; these objectives should be expressed as concise discrete problem statements with distinguishing designations as in Section 3.3. These designations must be carried forward in the subsequent DQO steps, with each problem statement carried through independently. For example, for DQO Step 3, data needed for soil characterization should be listed under a different designation that for vegetation. Further, these designations should correspond to the problem statements in the first step. The background information presented before the problem statements should include the information currently presented under Section 3.2.2; this information can be presented as the CSM as it relates to this task. Based on outcomes from upcoming A/T and P4/Monsanto project meetings, please revise accordingly.

Response: *The DQOs will be revised based on suggestions and examples provided during a meeting with the A/T 15 October 2008 and from review comments on draft DQOs (submitted to the A/T 7 November 2008) during conference calls with the A/T held 20 November and 1 December 2008.*

13. Page 4, Section 3.1.2. P4/Monsanto has failed to recognize the most important decision that needs to be identified: Do the dumps and vegetation pose an unacceptable risk to human health and the environment? In the second step of the DQO process, the specific questions that must be answered for each of the problem statements should be delineated in DQO Step 2. Additionally, for each question/decision the potential outcomes must be identified as described in the guidance. Based on outcomes from upcoming A/T and P4/Monsanto project meetings, please revise accordingly.

Response: *The DQOs will be revised based on suggestions and examples provided during a meeting with the A/T 15 October 2008 and from review comments on draft DQOs (submitted to the A/T 7 November 2008) during conference calls with the A/T held 20 November and 1 December 2008.*

14. Pages 4 and 5, Sections 3.1.3 to 3.1.5.
    - Inputs to the decision or the decision rules are the COPC concentrations in the soil and vegetation. The decision rules should be along the lines that if COPC concentrations are above screening benchmarks or applicable background levels, then risks to human and ecological receptors will be evaluated.
    - Given the areal extent of some of the waste dumps, it may not necessarily be appropriate to make an entire dump the decision unit, especially based on 5 samples.
    - The decision is not based solely on livestock. The decision rules for soil and vegetation should be along the lines that if COPC concentrations are above screening

benchmarks or applicable background levels, then risks to human and ecological receptors will be evaluated. Statistics should not come into play at this time.

As for the above steps, these DQO steps should be specific to the different problem statements and per the guidance. Relevant and specific information is needed for each of these steps. The narrative on the selection of the background area needs to be more robust, such as why this area appropriately represents background soil and vegetation conditions for the P4/Monsanto mines and why a closer site was not selected. Based on outcomes from upcoming A/T and P4/Monsanto project meetings, please revise accordingly.

Response: *The DQOs will be revised based on suggestions and examples provided during a meeting with the A/T 15 October 2008 and from review comments on draft DQOs (submitted to the A/T 7 November 2008) during conference calls with the A/T held 20 November and 1 December 2008. Background locations will be more thoroughly discussed, and if appropriate locations are identified, background locations in or near the mine areas will be included in the plan.*

15. Page 5, Section 3.1.5. P4/Monsanto must provide the veterinary benchmark value discussed in this Section.

Response: *The selenium vegetation benchmark provided in Raisbeck et al. (2006) is 5 mg/kg dw. This will be included in the appropriate locations in the SAP.*

16. Page 5, Section 3.1.6. If statistical sampling design will be implemented, Step 6 must identify the statistical parameters associated with the design as described in the guidance. If the proposed sampling design is judgmental rather than statistical, then this section must include a statement to the fact.

Response: *The DQOs will be revised to identify statistical and judgmental parameters associated with the sampling design to be implemented.*

17. Page 5, Section 3.1.7. Step 7 must clearly delineate sampling design rationale and present the sampling design (i.e., sample numbers and locations). The sampling design (i.e., sample numbers and locations per dump) must be consistent with ProUCL Version 4 guidance, that is, five samples per dump may be inadequate to characterize a parameter of interest or to make a statistically significant comparison to some PRG or to a background data set. More specifically, ProUCL recommends a minimum of 8-10 detected observations for background sampling and at least 8 to 10 detected observations from each of the populations under comparison.

Response: *The DQOs will be revised to present rationale of the sampling design consistent with ProUCL Version 4 guidance and subsequent discussions between P4 Production and the Agencies/Tribes.*

18. Page 5, Section 3.2.1. As related to the different problem statements in Step 7, the rationale and the associated samples or locations need to be clearly delineated to provide the needed information for informed site management decisions. Please do so.

Response: *The DQOs will be revised to present rationale and associated sample locations for each problem statement.*

19. Page 5, Section 3.2.1. The purpose of this investigation is not to determine if significant contamination exists based on a comparison to a background control. The purpose is to collect data in order to determine risk to human health and ecological receptors. Please revise accordingly.

Response: *The purpose will be restated as requested.*

20. Page 5, Section 3.2.1, Paragraph 3. P4/Monsanto provides some narrative discussion explaining why seasonal trends for selenium in vegetation is not a factor to consider, yet does not provide any references or data to support their conclusion. If there are site-specific data as implied, P4/Monsanto should provide it to support these conclusions. If there are no such site-specific data, then P4/Monsanto must provide a thorough discussion of the Mackowiak and Amacher results from southeast Idaho in the context of this project (e.g., What are the trends observed by Mackowiak and Amacher? How much difference would it make if sampling in August versus June? Is that likely to affect sampling decisions?). For example, Mackowiak and Amacher (Seasonal Plant Uptake of Selenium at Wooley Valley Unit 4 Lift 1 Lower Slope Waste Rock Dump-2005) suggested that mean selenium concentrations in grasses are highest during the early growing season and decrease from June into September. In contrast, mean selenium concentration in alfalfa were observed to be the highest in September. Without additional information to support P4/Monsanto's conclusion, the Agencies and Tribes may require vegetation sampling during both June and September.

Response: *The document will be revised to indicate that vegetation samples will be collected in both June and September. This will include the plan and rationale for re-sampling the June quadrats during the September sampling as discussed between the Agencies/Tribes and P4 Production on the 1 December 2008 conference call and in subsequent discussions.*

21. Page 5, Section 3.2.1. Please justify that the use of 5 samples from each dump is enough to adequately characterize each dump? For example, the State of Wyoming (Guideline 14, Recommended Procedures for Developing a Monitoring Program on Permanently Reclaimed Areas) recommends for monitoring of revegetation ten random samples on reclaimed areas up to 100 acres in size and one additional sample location for every additional ten acre incremental increase in acreage up to a maximum sample size of 50. EPA guidance recommends a minimum of 8-10 samples within an exposure unit (ProUCL Version 4.00.02 User Guide, EPA 600/R-07/038). Other guidance and plans recommend similar or more initial sampling (e.g., Fire Monitoring Handbook [National Park Service, 2003], Long-Term Revegetation Monitoring Plan, New World Mining District Response and Restoration Project [Maxim Technologies, 1999, for USDA Forest

Response: *The document will provide rationale to support the total number of samples to be collected from each dump and rationale to support development of statistically valid site-specific background samples.*

22. Page 6, Section 3.2.1, Paragraph 3 and Table 3-1a. As discussed previously in meetings, outcrops of the Phosphoria Formation are not suitable background locations for waste rock dumps. Prior to the disposal of waste rock on the surface, the pre-mining soil profile would be comprised of loess, other transported weathered geologic materials, and the weathered immediate underlying strata. Engineered and reclaimed waste rock dumps are not the natural geologic surface expression at those locations and the dumps have been graded and reclaimed which makes them attractive sites for unauthorized recreational use, much more so than natural rock outcrops. More appropriate background locations must be selected, i.e., on-site, undisturbed areas representative of pre-mining conditions. If such locations are non-existent within the area of the mine, only then should P4/Monsanto consider collecting representative background information from off-site areas.

Response: *The document will be revised to indicate that on-site, undisturbed areas representative of pre-mining conditions, when available, will be used to collect background samples (assuming appropriate areas exist). The document will include rationale for using off-site areas, if needed, for background sampling.*

23. Page 6, Section 3.2.1, Paragraph 3. This section addresses the number of dump and outcrop locations to be sampled. It is stated that the undisturbed outcrop will serve as a control to define background conditions. Is it possible that soils and vegetation on this particular outcrop could be unusually high in contaminant concentrations, setting background levels higher than others natural outcrops in the area? To establish background, it would be better to identify a number of natural outcrops and then randomly select background sites from that pool, thus establishing an average background level for the area. Please justify the use of only one background location.

Response: *If a suitable number background locations are identified, the document will be revised to indicate that the sample areas would be randomly selected from a pool of suitable background locations. This approach will be further refined and justified as the DQOs for the background sampling are refined.*

24. Pages 8 and 9, Section 3.2.2. The contents of this section provide some of the background information necessary for DQO step 1 and should be presented before identifying the problem statements.

Response: *Information provided in Section 3.2.2 will be used to provide background prior to the problem statements presented in the revised DQOs.*

25. Page 8, Section 3.2.2. Site-specific risk to humans has yet to be determined at the P4/Monsanto sites, therefore the conclusions on the effects posed by the sites are premature. The information presented here does not preclude the need for a site-specific risk assessment which must evaluate the potential risk to human receptors and for ecological receptors representative of each feeding guild that could be exposed to COPCs under reasonably anticipated current and future land uses. The CSM and food-web diagrams should be used to determine the appropriate receptors to be evaluated. These are important topics that should be covered in a risk assessment scoping document, as noted above. Please revise accordingly.

Response: *Conclusions presented in Section 3.2.2 will be deleted. The document will be revised to indicate that potential risks to receptors will be evaluated through the risk assessment.*

26. Page 8, Section 3.2.2, Paragraph 4. Delete. While the Area Wide Human Health and Ecological Risk Assessment (AWHHERA) (December 2002) determined that there was there was a low probability of significant human health effects in the region, it was also determined that potentially significant human health risks are indicated in the case of subsistence use of resources in highly impacted areas. It is also important to note that the AWHHERA did not evaluate the soil ingestion pathway for waste rock dumps. The three individual site-specific risk assessments for the P4 mine sites will determine whether or not there is a risk to human health.

Response: *Paragraph 4, Section 3.2.2 will be deleted.*

27. Page 8, Section 3.2.2, Paragraph 5. Delete. The statements provided here are premature and unsubstantiated. The individual site-specific risk assessments, through appropriate evaluation of various risk scenarios, including occupational worker and recreational user, will determine whether or not there is a risk.

Response: *Paragraph 5, Section 3.2.2 will be deleted.*

28. Page 8, Section 3.2.2, Contaminants of Potential Concern. Editorials, such as IDEQ honoring its prior position, are not needed. Please remove.

Response: *Editorial comments will be deleted.*

29. Page 8, Section 3.2.2, Pathways of Potential Concern. Wild ungulates can potentially consume substantial amounts of soil for its mineral content. These “salt licks” could become in essence an attractive nuisance if high Se concentrations are likewise associated with the minerals that they crave. Please address this concern.

Response: *The document will be revised to address soil consumption by wild ungulates as a pathway of potential concern. It will also be included in the SAP that, if present, features such as salt licks will be noted and mapped during the vegetation and soil evaluation of the waste rock dumps.*

30. Page 8, Section 3.2.2, Paragraph 2. The COPC list for soil and vegetation on waste dumps was addressed in other correspondence. The COPC list in the revised planning document should be revised accordingly. Note that the revised COPC list was deemed necessary to ensure consistency with EPA guidance and to address problems with the screening process used in the past, e.g., the Area Wide Risk Assessment (AWRA) initially screened COPCs based on a comparison to background.

Response: *The COPC list will be revised per the memo attached to the A/T comments.*

31. Page 8, Section 3.2.2, Paragraph 3. In the first sentence of this paragraph, P4/Monsanto indicates that the COPC list should be based on migration that would occur in the aqueous state. This statement is unsupported and not valid. Although a large portion of the migration of COPCs from source areas will be the dissolved fractions, other transport mechanisms likely occur to a lesser extent (e.g., particulate erosion migrating offsite during seasonal snow melt and wind dispersion of particulates). The supplemental characterization planning documents should be revised accordingly.

Response: *The document will be revised to include discussion of other COPC transport mechanisms. P4 Production will provide rationale for whatever decision is made associated with sampling off-dump areas for potential impacts. Such rationale may be a weight of evidence approach.*

32. Page 8, Section 3.2.2, Paragraph 5. The first sentence of the paragraph appears to be incomplete. Please revise as necessary.

Response: *Per response to Comment 27, paragraph 5, Section 3.2.2 will be deleted.*

33. Page 9, Section 3.3. The objectives identified here need to be identified as initial problem statements under DQO Step 1 so that subsequent procedures can be built upon in relation to the needs that these problems pose.

Response: *The objectives listed in Section 3.3 will be removed and used a foundation for determining the problem statements presented in the revised DQOs.*

34. Page 9, Section 3.3. These investigation objectives, as well as those provided in the 2004 Work Plan are not project objectives, they are tasks. One objective is to determine if there is a risk to human health or ecological receptors and one of the tasks necessary to complete that objective is to characterize the concentration of COPCs in soil and vegetation on waste rock dumps. Please revise this section accordingly.

Response: *The objectives listed in Section 3.3 will be removed and used a foundation for determining the problem statements presented in the revised DQOs.*

35. Page 9, Section 3.3. The section almost exclusively focuses on selenium and vegetation consumption. We all agree that this is of high concern at the site, however other contaminants (e.g., arsenic, cadmium, vanadium, etc.) occur that contribute to the overall risk posed by the sites. Please revise as necessary.

Response: *The document will be revised to include all COPCs identified by the A/T and to acknowledge the soil consumption pathway.*

36. Page 9, Section 3.3, Paragraph 2. As this is new work as required by the Agencies and Tribes and as this will be a stand-alone SAP, delete this paragraph and subsequent bullets and replace with a more concise outline of field sampling tasks.

Response: *The FSP will include a concise outline of field sampling tasks.*

37. Pages 10 to 22, Sections 4, 5, and 6. Sections 4, 5, and 6 present information that should be included in a FSP. Please revise as necessary.

Response: *The work plan will be presented as a SAP and will include a FSP presenting information from Sections 4, 5, and 6.*

38. Page 10, Section 4.4.3. Why the jump from Section 3.3 Investigation Objectives to 4.4.3? This should be a stand-alone document. The excessive references to other documents make review very difficult.

Response: *The work plan will be presented as a SAP and include a QAPP and FSP.*

39. Page 10, Section 4.4.3. Explicitly state the investigation objectives in this work plan.

Response: *The revised DQOs will explicitly state the investigation objectives.*

40. Page 13, Section 5.3. This project schedule is no longer feasible and will need to be revised following A/T and P4/Monsanto scoping sessions on DQOs.

Response: *The schedule will be revised to 2009.*

41. Section 6.4, page 15, 1st paragraph. P4/Monsanto states that the Agency/Tribal rationale for requiring soil samples collected from a depth of six inches in "unknown."

    The Agencies' and Tribes' rational, that ATV use on public lands disrupts the soil profile to depths significantly greater than two inches and this poses an uncharacterized exposure pathway, was discussed with P4/Monsanto in a conference call on may 29, 2008 and conveyed to P4/Monsanto in an email from Mike Rowe on 5/30/08. Delete the sentence "The reason for the change is unknown."

Response: *The provided rationale will be incorporated into the revised document.*

42. Page 16, Section 6.4.2. An SOP for soil and vegetation sampling should be prepared to adequately describe the procedure to be used. The sampling strategy focuses on dumps and backfilled pits. However, haul routes, loading and tipple areas, stockpile areas, and pits are also potential areas of exposure/concern. The soil and vegetation at these features should be characterized as well. The revised planning document should include maps that delineate the various exposure areas that will be characterized under this task. It should also include a table summarizing the size of each exposure area, and the number of samples planned for each exposure area. Please revise accordingly.

Response: *The document will include the necessary information and rationale used for determining which potential source areas are to be sampled.*

43. Page 17, Section 6.6.3. There are several statements regarding noxious weeds that need further clarification. This section suggests that noxious weeds are inedible and avoided by livestock and wildlife and would not be present because they were not seeded. It is not clear if the discussion only refers to weeds on the state noxious weed list, or to all alien plant species. Most weeds, noxious-listed and otherwise, travel on the wind or on some other transport mechanism and arrive to a site on their own, thus there is the potential that many weeds could exist on these waste rock areas. They are often colonizers and are particularly suited to establishing on new and disturbed soils. Additionally, some weeds would likely be palatable to livestock and/or wildlife (e.g. *Kochia scoparia, Melilotis sp.*) and could be accumulators of Se. Please clarify.

Response: *The document will be revised to more clearly define which vegetation types will be sampled and provide the rationale used for the determination.*

44. Page 18, Section 6.6.6. Please explain the relationship between the vegetative characterization (i.e., species and relative abundance) of the dump and the vegetation sampling. For example, will it be possible to use data from the two efforts to approximate the amount (e.g., mass) of a particular species on a waste rock dump?

Response: *The document will be revised to include rationale for characterizing species and relative abundance of vegetation rather than estimating biomass of individual species.*

45. Page 19, Section 6.6.6. Vegetation will be further classified as to its selenium accumulation potential, which is a good idea. However, the text indicates that "… normal Group 3 species have been found to contain selenium at concentrations over 100 mg/kg dw when growing in affected soils." As we know waste rock dumps are affected soils, classifying as "normal" plants that typically would not accumulate selenium except when growing in affected soils would give a skewed picture of the waste rock dumps. In other words, plants that would accumulate selenium might be underrepresented. Please explain why this scenario could not happen.

Response: *The information of the distribution of selenium accumulators is supplemental information that will be used to help assess overall risk associated with the waste rock dumps. This information will be independent of the sampling program that has a random component; however, it will be considered when evaluating the sampling program results and the potential need for any additional focused sampling.*

46. Page 20, Section 6.6.7. This section references the so-called FUBOB statistic. This reference must be revised to indicate that for purposes of this work plan, statistical methods and approaches will be consistent with previous Agency/Tribal direction to use methods and approaches described in ProUCL, version 4. As previously noted, the Agencies and Tribes question the applicability of the FUBOB statistic as a measure of the upper threshold of background as promoted by P4/Monsanto because it may introduce unacceptable bias as it has been calculated. In addition, this particular statistic is not recognized or endorsed in any pertinent EPA guidance on the subject of background statistics or risk assessment. Application and adherence to EPA approved statistical methods will help avoid potential disputes of the summary statistics, including disputes over: (1) sample size; (2) indefensible distributional assumptions (e.g., assumption of normality or lognormality without appropriate support for those assumptions); (3) treatment of outliers; (4) handling of non-detects; and, other factors (including representativeness and data quality issues). The Agencies and Tribes, therefore, will require P4/Monsanto to use alternative up-to-date EPA-approved statistical procedures (such as those appearing in ProUCL, Version 4 software and users manual) to calculate concentrations.

Response: *The document will be revised to indicate usage of ProUCL or other EPA-approved statistical procedure.*

Editorial Comments

Page 8, Section 3.2.2, Receptors of Potential Concern, Paragraph 2, Line 1. Eliminate *on* after *scenario.*
Page 8, Section 3.2.2, Receptors of Potential Concern, Paragraph 3, Line 2. Capitalize *tribes* to be *Tribes.*
Page 8, Section 3.2.2, Receptors of Potential Concern, Paragraph 3, Line 2. Eliminate *for* and add *asked that* to read "…the agency has asked that another survey…"

Response: *The editorial revisions will be made.*